RESEARCH PROBLEM STATEMENT

Problem Title: Advance Warning Signal Site Selection Evaluation Matrix **No.: 05.06-6**

Submitted By: Mack Christensen (UDOT)/Grant Schultz (BYU) **E-mail:** mackchristensen@utah.gov gschultz@byu.edu

1. Briefly describe the problem to be addressed:

UDOT has installed advance warning signals (AWSs) at three locations on Bangerter Highway, one location on S.R. 201, one location on U.S. 89, and one location on SR-18. The intent of these installations is to improve safety by providing advance warning to drivers of the change in signal indication. Early installations were evaluated in a previous study, while the current installations on Bangerter Highway are under evaluation to determine their effectiveness and draft guidelines are currently being developed through a technical advisory committee to guide future installations. The purpose of the proposed research would identify potential locations for future AWS installation based on the guidelines and effectiveness identified in the current AWS evaluation project. One tool that would be used in identifying future AWS installations is the GIS enabled web delivered data almanac. The databases included in the almanac include crash, speed, geometric conditions (i.e., horizontal and vertical data), and AADT data. This tool would be used to pinpoint high crash locations that could then be evaluated further using a site selection evaluation matrix to identify locations that meet the guidelines identified. This project would provide an opportunity to follow up on current research by establishing a site selection matrix and subsequently identifying candidate locations for future installations to aid in improving the safety and efficiency of the highway network.

Strategic Goal: ☐ Preservation ☒ Operation ☒ Capacity ☒ Safety (Check all that apply)

2. List the research objective(s) to be accomplished:

1. Application of advance warning signal guidelines and identification of candidate AWS installation locations.
2. Utilization of the GIS enabled web delivered data almanac to identify high crash locations.
3. Comparison of candidate locations with current AWS evaluation results and guideline criteria.

3. List the major tasks required to accomplish the research objective(s): 9-12 month Estimated person-hours 1,500

1. Finalize AWS installation guidelines.
2. Identify high crash locations using the GIS enabled web delivered data almanac.
3. Further evaluate high crash locations to identify locations where AWS installations may prove effective.
4. Use matrix to evaluate existing installations.
5. Establish technical advisory committee to evaluate candidate locations based on guidelines and previous research results.
6. Identify candidate sites for AWS installation.
7. Develop standard drawing for typical installation.

4. Outline the proposed schedule (when do you need this done, and how we will get there):

It is recommended that this project begin in early January 2006 with the data-mining portion of the project.

A list of proposed sites would be identified and evaluated by the TAC during the Summer 2006.

Concurrent to this process, the evaluation matrix would be established and the guidelines refined based on the new research.

At the end of the Summer 2006 the results would be tabulated final recommendations made for future installation.

5. Indicate type of research and / or development project this is:

Large: ☐ Research Project ☒ Development Project
Small: ☐ Research Evaluation ☐ Experimental Feature ☐ New Product Evaluation ☐ Tech Transfer Initiative
☐ Other_____

6. What type of entity is best suited to perform this project (University, Consultant, UDOT Staff, Other Agency, Other)?

University and UDOT Staff joint participation.

7. What deliverable(s) would you like to receive at the end of the project? (e.g. useable technical product, design method, technique, training, workshops, report, manual of practice, policy, procedure, specification, standard, software, hardware, equipment, training tool, etc.)

The deliverables expected from this project would include: 1) refined guidelines for AWS installation based on the analysis; 2) evaluation matrix; 3) identification of high crash locations on state roadways; 4) sub-identification of intersections that meet AWS installation guidelines for future AWS installation; 5) development of a standard drawing; and 6) documentation of observations, results, and recommendations.

8. Describe how this project will be implemented at UDOT.

This project will be implemented at UDOT through the traffic and safety program. The results of the study will be very useful in identifying high crash locations with the potential for installation of AWS devices to provide improvements in safety statewide.

9. Describe how UDOT will benefit from the implementation of this project, and who the beneficiaries will be.

UDOT will benefit from this project through an increase in the safety and efficiency of candidate AWS installation locations. This would include a reduction in the number and/or severity of crashes, a reduction in red-light running violations, and an overall improvement in the driver experience. This project will also standardize AWS installations statewide.

10. Describe the expected risks, obstacles, and strategies to overcome these.

No known risks.

11. List the key UDOT Champion of this project (person who will help Research steer and lead this project, and will participate in implementation of the results): Mack Christensen, UDOT Region 2 Operations Engineer, (801) 975-4827

12. Estimate the cost of this research study including implementation effort (use person-hours from No. 3):$35,000

13. List other champions (UDOT and non-UDOT) who are interested in and willing to participate in the Technical Advisory Committee for this study:

Name	Organization/Division/Region	Phone	Attended UTRAC?
A) Grant Schultz	Brigham Young University	(801) 422-6332	
B) Deryl Mayhew	UDOT Region 2 Signal Engineer	(801) 887-3605	
C) Ritchie Taylor	UDOT Region 2 Traffic Engineer	(801) 887-3717	
D) Doug Bassett	UDOT Region 3 Traffic Engineer	(801) 227-8019	
E) Troy Torgersen	UDOT Region 4 Traffic Engineer	(435) 893-4707	
F) Robert Clayton	UDOT Safety Programs Engineer	(801) 965-4521	
G) Darin Deursch	UDOT Region 1 Traffic Engineer	(801) 620-1607	

14. Identify other Utah agencies, regional or national agencies, or other groups that may have an interest in supporting this study:

Salt Lake County, FHWA, and Other DOTs.